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## HEALTH CARE KIOSK WITH HANDICAPPED ACCESSIBLE SEAT

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### BACKGROUND OF THE INVENTION

5 The field of medicine has long employed health care screening to diagnose and tract patients' health. An annual physical examination is a well-known part of patient medical care.

Hospitals, health clinics, and pharmacies, in addition to an active role is supplying medical supplies and pharmaceuticals, have actively promoted various  
10 health care screenings and wellness programs. Programs are sometimes offered with the help of other health care providers or coordinated on a national basis with groups such as the American Lung Association, the American Diabetes Association and the American Podiatric Medical Association.

To increase attention to the health care screening category, many medical and  
15 health produce retailers offer medical tests and screening for consumers visiting their stores. Most commonly, the retailers check cholesterol levels and blood pressure, although many other tests are available. In addition to supplying a valuable customer service, in-store testing effectively educates consumers about various health problems that can be better managed by a regimen that includes monitoring. Typically  
20 consumers are unaware of the technological advances that have made health care screenings feasible in the clinical, retail, and home settings. Pharmacies and drug retailers have generally found that point out that the availability of screening test devices in the stores increases traffic and cultivates customer loyalty.

The offer of in-store testing commonly is highly popular among customers and  
25 greatly boosts the number of people visiting the store. In-store testing is valuable for positioning stores as health and wellness centers as well as retailers of health care

products. In-store testing increases sales since a consumer who learns of a health problem through screening in the store has some likelihood of purchasing a home test kit to monitor the problem. For example, a customer who discovers a problem of high blood pressure through an in-store test is a likely candidate to purchase a home test kit.

In-store health care screening expands the pharmacist's role in patient care through education. Test device manufacturers have advanced the design and functionality of products to simplify usage and improve accuracy. The challenge for further improvements in health care screening is to educate consumers about the need for medical tests, and demonstrate that many tests are effectively performed by publicly available devices or at home.

A present concern is that health screening is performed on an insufficient segment of the population to efficiently prevent or treat ailments. Other concerns are that health screening is too costly, limited in scope, and time-consuming both for individual patients and health care providers. Despite these deficiencies, a strong awareness exists of a need and desire for improved health screening procedures and equipment. Health care providers, insurance companies, and employers that ultimately pay for health care have encouraged development and usage of improved, accurate yet economic health screening facilities both for treatment and prevention of health care problems.

Generally individual doctors and small groups of doctors have insufficient capital to maintain a complete health screening facility. Even if more health care providers were suitably equipped, typically only a small part of the population exploits health screening facilities due to time and cost considerations and apathy.

Health screening devices and facilities, to be most useful to the public in general, should have a capability to serve a wide range of patient and user needs and situations. For example, health-screening devices such as blood pressure measurement stations typically have a fixed seat that obstructs a user in a wheel chair from easily accessing the blood pressure cuff and the test controls.

What is needed is a health screening device or facility that allows easy access to patients with various mobilities.

## SUMMARY

5 A health care test kiosk includes a carrel body that supports a console housing and has a vacant knee-space beneath the console housing. The carrel body includes a support side panel forming a lateral side and extending beyond the console housing and the knee-space. A physiological test interface is connected to and supported by the carrel body on the support side panel. A retractable seat is movably connected to the support side panel of the carrel body for selective positioning in a location ranging  
10 from withdrawn into the knee-space beneath the console housing to extended completely from the knee-space.

In accordance with an aspect of the health care test kiosk, a retractable seat assembly includes a retractable seat and a connector fixedly coupled to the retractable seat and capable of moveable coupling to the support side panel of the carrel body for  
15 selective positioning in a location ranging from withdrawn into the knee-space beneath the console housing to extended completely from the knee-space.

In accordance with another aspect of the health care test kiosk, a method of fabricating the health care test kiosk includes forming a carrel body supporting a console housing and having a vacant knee-space beneath the console housing, and  
20 attaching a support side panel as a side of the carrel body. The support side panel forms a lateral side and extends beyond the console housing and the knee-space. The method further includes attaching a physiological test interface to the carrel body on the support side panel, and movably coupling a retractable seat to the support side panel of the carrel body for selective positioning in a location ranging from withdrawn  
25 into the knee-space beneath the console housing to extended completely from the knee-space.

## BRIEF DESCRIPTION OF THE DRAWINGS

The features of the described embodiments believed to be novel are specifically set forth in the appended claims. However, embodiments of the invention  
30 relating to both structure and method of operation, may best be understood by

referring to the following description and accompanying drawings.

**FIGURE 1** is a schematic block diagram illustrating a suitable network for interconnecting one or more health care test kiosks and a health information server.

**FIGURE 2** is a pictorial diagram illustrating a suitable health care test kiosk for usage in interfacing to a health care information system.

**FIGURES 3A, 3B, 3C, and 3D** are four three-dimensional pictorial diagrams showing various frontal views of a health care information kiosk with a retractable seat.

### DESCRIPTION OF THE EMBODIMENTS

Referring to **FIGURE 1**, a schematic block diagram illustrates a suitable network **102** for interconnecting one or more health care test kiosks **110** and a health information server **104**. Typically, an individual health care test kiosk **110** includes a processor **106** or controller with a storage **108** or memory that maintains a local archive of user information that stores a relatively small number of relatively recent test results, measurements, and possibly other information. The processor **106** executes a logic (not shown), typically a computer program, that is stored as software, firmware, control logic or other executable forms as are known by one of ordinary skill in the art. In an illustrative health care information system **100**, the health care test kiosk **110** employs additional computing power by adding a digital signal processor (DSP) **112** that operates in conjunction with the processor **106** to perform computation-intensive operations such as various health test operations.

The local archive includes tracking of health reading including blood pressure, heart rate and weight. Individual users also have an individual personal health site on the health information server **104**. The health information server **104** is generally used to store a long-term archive of user results, measurements, and information received from the individual health care test kiosks **110**. In one example, the local health care test kiosk **110** stores information from many users and all information that is generated on the health care test kiosk **110** is automatically loaded, for example on a daily basis, to the central health information server **104**. The results are sent to the

health information server **104** for long-term storage and archiving. The information for the individual users are stored on corresponding personal health sites that are assigned to the particular individual users so that accurate and current information are available for all of the individual users.

- 5 In the illustrative example, the individual users determine the degree and level of health care information to be acquired and stored on the site. The individual user assigns a privilege level to allow the user's physician to enter information to the site with a desired level of security. Using the secured access to the user's site, the physician can be allowed to download health care information to the user site.
- 10 Information is not changed on the site so the physician's level of security insures accuracy of the downloaded information. The physician's security specification permits the physician to transmit secured prescription orders and records to the individual health care site.

- The health care information system **100** benefits the individual users by
- 15 permitting secured accessibility of health care information and prescription needs anywhere in the world through usage of the internet. The health care information system **100** supplies accurate and current individual health care information that is accessible in a crisis or emergency situation.

- In one example, the health information server **104** includes a layered security
- 20 program for protecting user data from privacy violations. In an example of a layered security program, a user's personal health site can have a sixteen digit security card for entry into the health care test kiosk **110** and an individual personal identification (PID) number to access the user's personal health site on the health information server **104**. The level of security is equivalent to the security of an ATM machine in which
- 25 the only person having access is the user since the user establishes the PID number.

- The health care test kiosks **110** are generally accessible to the public. For example, pharmacies or drug stores are suitable facilities for supplying floor space for a health care test kiosk **110**. Other suitable facilities include other retail outlets, health care providers such as physician offices, clinics, hospitals, and the like. The facilities
- 30 housing a health care test kiosk **110** typically have an agreement with the kiosk

supplier to supply information, services, and products. The health care test kiosk **110** executes various functions such as health testing and health evaluation. In some systems, the health care test kiosk **110** supports operations including health testing and measurement, health and fitness evaluation, and various health care information sources. Various health tests may be supported. Common health tests include blood pressure testing, heart rate testing, and the like. For example, some systems may support various noninvasive blood analyses using pulse oximetry data acquisition. Measurements may include simple or complex measurements. One common measurement is a weight measurement that is supplied using a seat scale that is installed into the seat of the health care test kiosk **110**. Health care information sources may include a drug encyclopedia, a vitamin and supplement encyclopedia, an electronic health care library, health care provider directories, and the like.

The health care test kiosk **110** interfaces to a server such as a store computer system or to a centralized server that services a wide geographical area. For example, the health care test kiosk **110** may interface to a local pharmacy or drug store computer. The health care test kiosk **110** may alternatively interface to a main frame health information server **104** that services a large area such as a country or region of the world. The health care test kiosk **110** in combination with the health information server **104** typically includes a highly comprehensive pharmacy library covering prescription drugs and over-the-counter remedies.

The individual health care test kiosks **110** commonly include display software that displays a selected idle presentation, an attract screen with still-frame or dynamic graphics, or plays video clips that promote a selected party such as the sponsoring store or medical service providers.

Software programs in the individual health care test kiosks **110** is updated by downloading, for example via internet access, or media transfer such as flexible disk loading.

The health information server **104** commonly supports Internet sites for user access of health information, storage of personal history information, and to shop for products that are not available local to the health care test kiosk **110**.

Referring to **FIGURE 2**, a pictorial diagram shows a suitable health care test kiosk **110** for usage in interfacing to a health care information system **100**. The health care test kiosk **110** includes a test interface **212**, a user interface **214**, and a display **216**. Some examples of the health care test kiosk **110** can include a measurement interface **222** such as a weighing scale. The test interface **212** and user interface **214** are connected to a processor or controller (not shown) that executes diagnostic test operations using data acquired using the test interface **212**. In an illustrative example, the test interface **212** is a blood pressure cuff **213** for acquiring blood pressure measurements. A microphone **211** is attached to the blood pressure cuff **213** to measure a sound or audio signal. The user interface **214** is used to acquire patient data and other information from the user. The processor includes communication interfaces for communicating with the test interface **212**, the user interface **214**, and a remote terminal so that the health care test kiosk **110** can be connected into a communication network (not shown). In some systems, the health care information system **100** includes a telephone handset **218** that a user may employ to receive information from the health care information system **100** in privacy or for usage in telephone communication. Some versions of the health care test kiosk **110** optionally include a printer **220** for printing test results, information materials, advertisements, coupons, and the like.

The illustrative test interface **212** is a blood pressure cuff **213** with one or more pressure transducers (not shown) for acquiring blood pressure waveforms from the user. The pressure transducer has an electrical connection to the processor via the communication interface so that pressure waveform data is supplied to the processor. The processor executes a computerized blood pressure detection algorithm to produce highly accurate measurements of systolic and diastolic blood pressure, and mean blood pressure. The processor also analyzes the blood pressure waveforms to detect heart rate information.

The processor executes software programs including data analysis routines that produce highly accurate blood pressure and heart rate measurements. The health care information system **100** acquires other health care information from the patient and from various health care databases via network communication linkages to generate a

full health appraisal. The health care information system **100** includes local storage and the network communication link to external storage resources to allow a user to access pertinent health care information. For example, the health care information system **100** permits the user to access a full drug encyclopedia that lists

- 5 pharmaceutical drugs that are currently available on the market. A health care provider directory is accessible via the network interconnection, either on the kiosk or by an Internet connection, to enable the user to find area physicians, specialists, clinics, hospitals, health maintenance organizations (HMOs), and the like.

- One example of a suitable display **216** is a high-resolution Active Matrix color  
10 touchscreen display. The display **216** is used to present menus and controls, as well as to present information including test results, measurements, health information such as seasonal health tips. A text display shows text in one or more of various selected languages. Many other displays of various sizes, specifications, and utilizing various technologies are also suitable.

- 15 One example of a suitable test interface **212** is a blood pressure cuff **213** including a nylon washable exterior cuff with a seamless inner natural latex bladder that is inflated using a pneumatic power system. A suitable cuff size is 30x12.5 cm. The cuff can be constructed of medical grade silicone tubing that is non-reactive, and thus allergy-free, to body tissue. Cuff pressure is regulated by pressure monitors (not  
20 shown) that are inherently stable and are calibrated to function accurately with cuff pressure variations of less than +/-1% over a full operating range of systolic maximum pressure 250mm-Hg and minimum pressure 80mm-Hg, and diastolic maximum pressure 130mm-Hg and minimum pressure 38mm-Hg, a differentiation of 8 points between systolic and diastolic pressure, and a heart rate from 38 to 200bpm. The  
25 monitors use automatic zero pressure variations to prevent accuracy from being affected by altitude level or other changes in atmospheric pressure, temperature, and humidity. The exemplary test interface **212** also detects sound signals for usage with Korotkoff sound detection. Both pressure signals and sound signals are converted to digital form and transmitted to the processor to perform blood pressure measurements  
30 using both oscillometric and auscultatory analysis. The pressure and sound signals can be processed to determine heart rate measurement using a beat-to-beat averaging



method. In some examples, tests are activated using a touch screen in which a virtual green start button initiates a test procedure by inflating the cuff that the patient has positioned around the arm. Touching the display screen halts the test and returns the pneumatic cuff to the open position. Various other specifications, materials, and technologies or combinations of technologies that are known by those having ordinary skill in the art are also suitable.

An illustrative measurement interface **222** is a weighing scale formed into a moveable seat **224** that is attached to the health care test kiosk **110**. The seat scale has accuracy within one pound. The seat **224** of the health care test kiosk **110** is moveable so that the test interface **212** and display **216** are wheel chair accessible and easily used by the disabled without assistance.

Referring to **FIGURES 3A, 3B, 3C, and 3D**, four three-dimensional pictorial diagrams show various frontal views of a health care information kiosk **110**. **FIGURE 3A** illustrates a frontal view of the full health care information kiosk **110** with a retractable seat assembly **312** in a enclosed position within the kiosk. **FIGURE 3B** illustrates a frontal view of the full health care information kiosk **110** with a retractable seat assembly **312** in a withdrawn from the enclosed position with respect to the kiosk. **FIGURE 3C** shows a locking mechanism of the retractable seat assembly with the seat enclosed into the kiosk. **FIGURE 3D** shows the locking mechanism of the retractable seat assembly **312** with the seat assembly in an extended position. The health care test kiosk **110** includes a carrel body **310** and a moveable and retractable seat assembly **312**.

The carrel body **310** has an entry side panel **314** and a support side panel **318** that are opposing and connect at right angles to a back panel **316**, forming three sides of a console housing **308**. The console housing **308** contains a health care test controller (not shown) with input interface **317** and display **319** that respectively control a test acquisition and display a test result. The console housing **308** also includes a planar top panel **320** connected at right angles to top edges of the entry side panel **314**, the back panel **316**, and the support side panel **318**. The console housing **308** also includes a planar bottom panel **322** that forms a plane parallel to the plane of

the top panel **320** and is affixedly attached at a position medial to the top and bottom edges of the entry side panel **314**, the back panel **316**, and the support side panel **318**. The bottom panel **322** is interposed at the medial position at a suitable height from the floor to allow sufficient vacant knee-space for a person seated on the seat assembly

5 **312**. The structure of the console housing **308** is completed by a display panel **324** that opposes the back panel **316**, connects to edges of the top panel **320** and the entry side panel **314**, connects to an edge and surface of the support side panel **318**, and connects to a surface of the bottom panel **322**. A portion of the bottom panel **322** extends forward beyond the display panel **324** to form a resting surface for the

10 convenience of a user.

The support side panel **318** extends forward beyond the forward edges of the display panel **324** and the entry side panel **314**. The support side panel **318** supports a physiological test structure **326** that, in the present example, is a blood pressure test interface **328**. The physiological test structure **326** is moveable or positionable to

15 permit testing of different sized users. For example, the illustrative physiological test structure **326** is connected to the support side panel **318** at a pivot point so that a test acquisition element, such as a blood pressure cuff, can be moved to various positions along a radius to allow testing of users ranging from large adults to small children. The moveable or positionable characteristics of the physiological test structure **326** are

20 also useful for allowing test access to users in different positions. For example, a user in a wheel chair may position the seat assembly **312** in the knee-space beneath the console housing **308**, move the wheel chair into a position near the physiological test structure **326**, and pivot the physiological test structure **326** into a suitable position for acquiring a measurement.

The support side panel **318** has a mounting surface **330** upon which is mounted a seat track **332**. In the illustrative health care test kiosk **110**, the seat track **332** is an elongated bar with a C-shaped cross-sectional form **334**. The seat track **332** extends longitudinally from front to back of the support side panel **318** in a horizontal configuration so that the seat assembly **312** that is movably attached to the health care

25 test kiosk **110** can move horizontally beneath the console housing **308** and retracted forward from the console housing **308**. The physiological test structure **326** is

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positioned so that the seat assembly 312 is clear from obstruction whether the seat assembly 312 is pushed beneath the console housing 308 or extended from the console housing 308. A seat lock 336 is also affixed to the mounting surface 330 of the support side panel 318, typically positioned near a forward portion of the seat track

5 332. The seat lock 336 permits the seat assembly 312 to be held firmly in place when a user is using the health care test kiosk 110.

The illustrative seat assembly 312 has a top seat panel 338, supported on a support side 337 by a moveable connection to the seat track 332 and supported on an entry side 339 by a fixedly attached seat support 340. The illustrative top seat panel

10 338 is shown as a planar panel, generally in the form of a rectangle except with corners rounded on the entry side of the health information kiosk 110. The top seat panel 338 in other examples may take various other forms. For example, instead of a planar surface, the top seat panel 338 may have a contoured top surface for comfort of the user. In the exemplified seat support 340 includes a side seat support 342 and a

15 front seat support 344 that are firmly attached at an angle, such as a right angle, that supports the top seat panel 338 in two dimensions. Top surfaces of the seat support 340 lie in a single plane and are fastened to the top seat panel 338. The seat assembly 312 is removably and retractably attached to the carrel body 310 by a moveable connector (not shown) that is firmly affixed to the top seat panel 338 and movably

20 connects to the seat track 332. The seat assembly 312 is generally a suitable size to fit completely within the cavity beneath the console housing 308 when the seat assembly 312 is positioned in a withdrawn position.

In an illustrative example, the moveable connector is a horizontal bar (not shown) with a T-shaped cross-section so that the T-connector is movably held within

25 the C-shaped cross-section of the seat track 332. In other suitable examples, the moveable connector may be a plurality of T-brackets (not shown) that are affixed at regular (or otherwise) intervals along the side of the top seat panel 338. In other examples, the seat track 332 may include a horizontally-disposed rod (not shown) that is disposed within one or more cylindrical hinges that are attached to the top seat

30 panel 338 and have a hollow cylindrical central lumen encasing the rod. A lock handle 346 is attached to the seat assembly 312 and is operated to engage the seat lock

336. Other moveable attachment structures, which are known to one having ordinary skill in the art, may be used to movably connect the seat assembly 312 to the carrel body 310.

5 An alternative structure may include more than one seat lock 336 disposed at various positions on the support side panel 318 to selectively hold the seat assembly 312 at a plurality of positions. For example, one seat lock 336 may be disposed near the forward edge of the support side panel 318 to permit a large adult to sit a comfortable distance from the console housing 308. A second seat lock may be positioned a few inches back from the first seat lock to permit a smaller adult to more easily reach the console housing 308. A third seat lock may be positioned a few more inches back from the second seat lock to fit a child within the health care test kiosk 110. A seat lock may or may not be positioned at an innermost location closest to the back panel 316 so that the seat assembly 312 may be fully pushed into the health care test kiosk 110 to permit a user in a wheel chair to use the physiological test structure 15 326. An inner seat lock may be omitted in consideration of allowing a weaker user to withdraw the seat assembly 312 without reaching beneath the carrel body 310 knee-space and having to disengage the lock. Alternatively, an inner seat lock may be employed to prevent the seat assembly 312 from inadvertently rolling from beneath the carrel body 310 knee-space and interfering with a wheel chair user.

20 While the invention has been described with reference to various embodiments, it will be understood that these embodiments are illustrative and that the scope of the invention is not limited to them. Many variations, modifications, additions and improvements of the embodiments described are possible. For example, those skilled in the art will readily implement the steps necessary to provide the structures and methods disclosed herein, and will understand that the process parameters, materials, and dimensions are given by way of example only and can be varied to achieve the desired structure as well as modifications which are within the scope of the invention. Variations and modifications of the embodiments disclosed herein may be made based on the description set forth herein, without departing from the 25 scope and spirit of the invention as set forth in the following claims.

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In the claims, unless otherwise indicated the article "a" is to refer to "one or more than one".

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